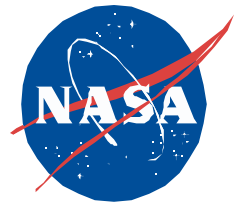




***EVA  
PROJECT  
OFFICE***

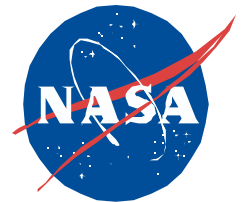


# **STS-111/UF-2 Flight Readiness Review**

**Tara E. Jochim  
EVA Project Office  
Johnson Space Center  
May 16, 2002**



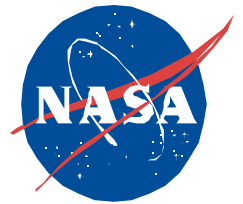
# Agenda



- **Overview**
- **EMU**
- **Tools and Crew Aids**
- **Fit Checks and Sharp Edge**
- **Significant Anomalies Since Previous FRR**
  - APFR Joint Sticking on STS-110/8A
  - Disposable In-Suit Drink Bag



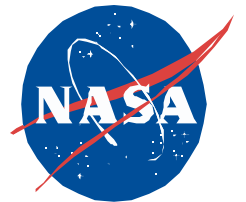
# UF-2 EVA Mission Overview



- **EVA Capability**
  - EVA Consumables to support the following:
    - Three scheduled EVA's from the joint airlock
    - One unscheduled EVA for ISS mission success tasks not completed or ISS contingencies
    - Two contingency EVA's for orbiter, RMS, and ODS contingencies
- **EVA Training**
  - Crew is fully trained on all EVA tasks
    - All currently anticipated tasks in EVA1 and EVA2 can be accommodated within scheduled six hour 30 minutes timeline
    - To accommodate all planned EVA3 tasks, a scheduled seven hour timeline is required



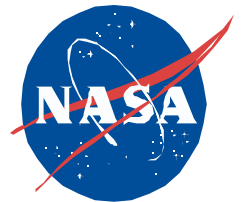
## UF-2 EVA Mission Overview (cont.)



- **EVA1 (Flight Day 5) – Six hours**
  - Power Data Grapple Fixture (PDGF) Install on P6
    - Fasten four Expandable Diameter Fasteners (EDF)
  - Service Module Debris Panel (SMDP) Stow on PMA1
    - Stow on APFR with SMDP Adapter (US/Russian hardware)
  - Remove MBS Thermal Blankets
    - Seven Thermal Blankets removed from ORU's after SSRMS power to MBS is confirmed



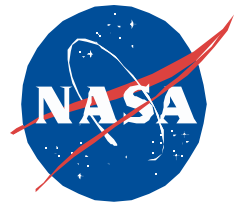
## UF-2 EVA Mission Overview (cont.)



- **EVA2 (Flight Day 7) – Six hours 30 minutes**
  - Umbilical connect (Primary)
  - Payload ORU Accommodation (POA) Rotation
  - Umbilical Connect (Redundant)
  - Fasten MBS bolts (four)
  - Interface Umbilical Assembly (IUA)
    - Drive the safing bolt seven turns on the zenith side of Mobile Transporter
  - Camera Light Pan/Tilt Assembly (CLPA) relocate
  - MSS Extension Cable stow



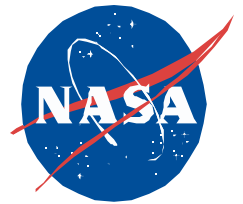
## UF-2 EVA Mission Overview (cont.)



- **EVA3 (Flight Day 9) – Seven hours**
  - Install thermal cover on Camera Light Assembly (CLA)
  - Remove tip Latching End Effector (LEE), temp stow on LAB
  - Remove old Wrist Roll Joint (WRJ), temp stow on joint FSE
  - Remove new WRJ from joint FSE
  - Install new WRJ on SSRMS
  - Install tip LEE on SSRMS
  - Transfer old WRJ to launch position on joint FSE
  - Remove CLA thermal cover
  - Relocate APFR's



# EMU / SAFER Logistics

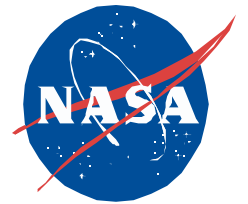


- **Two EMU's launched on UF-2 (L,L)**
- **Three EMU's currently on-orbit (M, L, XL)**
  - One Large (SSP) and one X-Large (ISS) used for UF-2 operations
- **Two EMU's returned on UF-2 (L, XL)**
  - Chang-Diaz—L, Perrin—XL
- **Three EMU's on-orbit post UF-2 (M, L, L)**
  - EMU hardware left on ISS for Korzun, Treshev and Whitson
- **One SAFER Manifested in MPLM/ Two SAFER's On-orbit - SAFER swap planned**



*EVA  
PROJECT  
OFFICE*

# EMU / SAFER First Flight and Open Items



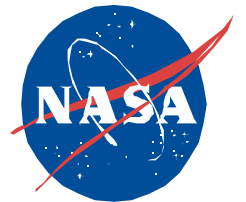
- **EMU/SAFER First Flight Items - None**
- **EMU Open FIAR's, Waivers, or Certification - None**
- **SAFER Anomalies - None**
- **SAFER Open Waivers or Certifications - None**



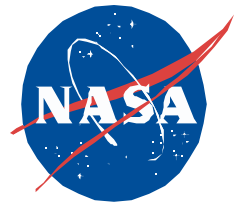


*EVA  
PROJECT  
OFFICE*

# EVA Tools and Crew Aids Logistics



- **EVA Tools and Crew Aids Left On-Orbit**
  - SMDP Adapter (Russian built with US Hex Probe)
  - PCMCIA Cards (leave 2 behind so 9A / 11A does not have to manifest)
  - ORU Transfer Bags-2 Small, 1 Medium
  - (2) Russian Adjustable Tethers
  - (2) Russian Fixed Length Tethers
  - (2) Orlan Tether Adapter Interface Blocks

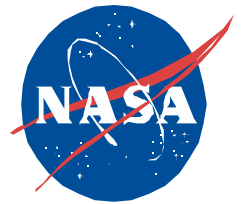


- **EVA Tools and Crew Aids Swapped**
  - (4) Long Duration Tie Down Tethers (up/dn) for contingency stow of SMDP bundle (if required, would leave behind to replace tethers from external P6 Aux bag)
  - Mini Work Station (MWS) hardware (swap on-orbit hardware with open FIAR)
  - Connector Cleaner Tool kit (swap with on-orbit kit with open FIAR)
  - 12 Retractable Equipment Tethers (swap 11 on-orbit with expiring life issues)
  - (2) ERCA's
  - Safety Tether
  - (2) Right Angle Drive (swap with on-orbit RAD's)
  - SAFER (swap)



*EVA  
PROJECT  
OFFICE*

# EVA Tools and Crew Aids Logistics

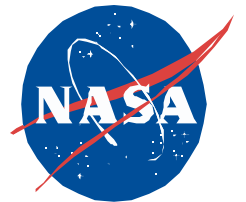


- **EVA Tools and Crew Aids Returned**
  - Strela Adapter (brought inside during Increment 4 EVA)
  - (2) Battery Charger Modules
  - Trace Gas Analyzer (from 8A)
  - PFR Attachment Device (from 8A)
  - PGT / EHIP Y-Power Cable
  - PGT



*EVA  
PROJECT  
OFFICE*

# EVA Tools and Crew Aids Logistics

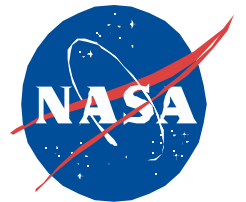


- **Standard contingency tools in port TSA**
- **PFR mounted on forward bulkhead**
- **Standard complement of slidewires, safety tethers, crew hook locks, and winches in payload bay**



*EVA  
PROJECT  
OFFICE*

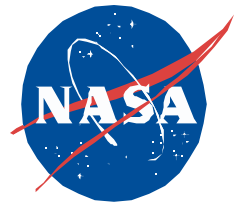
# **EVA Tools and Crew Aids First Flight and Open Items**



- **EVA Tools and Crew Aids First Flight Items**
  - EVA RF Camera Assembly (ERCA-spread spectrum)
  - Service Module Debris Panels Adapter
  - ORU Transfer bags (2 small / 1 medium)
- **Non-GFE EVA Hardware First Flight Items – None**
- **EVA Tools and Crew Aids Open FIAR's, Waivers, or Certifications - None**



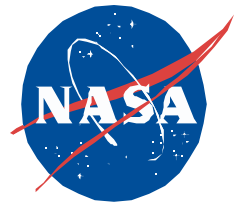
# Fit Checks and Sharp Edge Status



- **Tool-to-Tool Fit Checks (63 interfaces)**
  - 100 percent complete for payload bay, middeck, TSA and MPLM stowed tools
- **Tool-to-Interface Fit Checks (47 tasks)**
  - 100 percent complete
- **Sharp Edge Inspections**
  - 100 percent complete on SSRMS Joint, SMDP, PDGF, MBS
  - Final inspection planned during payload bay walk down on May 16, 2002



# Significant Anomalies Since Previous FRR

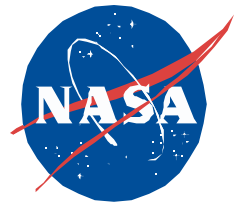


- **APFR Pitch Joint jammed on STS-110/8A**
  - Two units showed intermittent failure
  - This appears to be cold case related, UF-2 is a warm flight but reoccurrence of this issue cannot be ruled out
  - Backup plan has been developed if failure occurs
    - EVA 1: Retrieve another APFR
    - EVA 2: Retrieve another APFR
    - EVA 3: Retrieve PFR from SSP PLB
- **Disposable In-Suit Drink Bags (DIDB's)**
  - STS-110/8A EVA crew member experienced difficulty in getting water from DIDB during EVA
  - Based upon post-flight crew debrief and testing, the problem has been isolated to inadequate degassing of the DIDB
  - New procedures to degas the DIDB have been developed with the crew office and verified by KC-135 testing
  - STS-111/UF-2 will implement the new gas removal procedures



**EVA  
PROJECT  
OFFICE**

## **STS-111/UF-2 FRR**



- **There are no EVA exceptions for STS-111 / UF-2 FRR**
- **The EVA Project Office is ready to proceed with the launch of STS-111 / UF-2 and subsequent on-orbit operations pending completion of final payload bay walkdown and final sharp edge inspection**

**Original signed by**

**G. Allen Flynt**

**Manager, EVA Project Office**